

REMARKS

Reconsideration and allowance of the above-identified Application in view of the above amendments and the following remarks are respectfully requested.

Claims 1-5 and 22-25 are pending in the Application.

Specification

The disclosure was objected to because the specification ends mid-paragraph at paragraph 66 on page 16. Applicants have added missing page 17. The content of page 17 was included in the original parent Application EP 01301864.3 filed in Europe on March 1, 2001 the entire contents of which were incorporated by reference in the present Application as filed (see paragraph 1 of the specification). Therefore, Applicants respectfully submit that no new matter is added. Therefore, Applicants respectfully request that the objection to the disclosure be withdrawn.

Claim Rejections – 35 USC § 102

Claims 1-5, 22, 23 and 25 were rejected under 35 U.S.C. § 102(b) over Kawahashi (EP 0881538). Applicants respectfully traverse this rejection for at least the following reasons.

Kawahashi discloses a means for supporting a mask holding frame with a device which adjusts the mask holding frame and holds a mask perpendicular to an optical axis and while preventing bending or tilting of the mask (see col. 1 in Kawahashi). The mask is held by the mask holding frame via suction by means of a vacuum chuck (see col. 6, lines 21-25 in Kawahashi). Kawahashi merely adjusts a vertical angle, i.e. tilt, of the mask holding frame 1 with regard to a base 2 by screwing ball plungers 3 up or down such that the mask surface becomes perpendicular to the optical axis of an exposure light. Kawahashi does not handle the mask to align the mask in a horizontal direction, i.e. in a plane of the mask. Contrary to Examiner's contention, Kawahashi does not disclose, teach or suggest "holding the mask while handling the mask such that the mask is self-aligning in a horizontal direction," as recited in independent claim 1. Kawahashi does not disclose, teach or suggest "the mask is self aligning in a horizontal direction," as recited in independent claims 22 and 23.

Furthermore, contrary to Examiner's contention, Kawahashi does not disclose, teach or suggest "the holding comprising cooperation between a first set of connecting structures on the mask and a respective second set of connecting structures on a gripper," as recited in

claim 1. Kawahashi does not disclose, teach or suggest “kinematically determined holding comprising cooperation of a set of structures on a gripper with a respective set of structures provided in a circumferential region of the mask,” as recited in independent claim 22. Kawahashi does not disclose, teach or suggest “the mask having an imaging portion and locating surfaces fixed with respect to the imaging portion,” as recited in independent claim 23.

Kawahashi merely discloses that the mask holding frame has ball plungers 3 installed in three corner areas A, B and C. In the vicinity of plungers 3 are through openings which are penetrated by mounting pins 4. The mounting pins are screwed into screw openings 8 which are located on base 2 and tips of ball plungers 3 engage V-sleeves 7 located in base 2. In a corner area D of the mask holding frame and in base 2 are concave parts 11, 12 and installed therein is a compression spring 13 (see Figure 1 and col. 5, lines 50-58 and col. 6, lines 1-10 in Kawahashi). Consequently, Kawahashi merely discloses structures which are either located on the mask holding frame 1 (ball plungers 3, mounting pins 4, concave part 11) or located on the base 2 (V-sleeves 7, screw openings 8, concave part 12). Clearly, Kawahashi does not disclose, teach or suggest connecting structures or locating structures on the mask. In fact, the mask in Kawahashi is simply attached by means of vacuum chuck in the mask holding frame 1 (see col. 6, lines 22-23, col. 7, lines 37-38, col. 9, lines 36-38 in Kawahashi). In other words, the mask in Kawahashi is simply held by the mask holding frame 3 by using suction. Consequently, for at least the above reasons, Kawahashi does not disclose, teach or suggest the subject matter recited in claims 1, 22 and 23.

Therefore, Applicants respectfully submit that claims 1, 22 and 23, and claims 2-5 which depend from claim 1 and claim 25 which depend from claim 23, are patentable. Thus, Applicants respectfully request that the rejection of claims 1-5, 22, 23 and 25 under § 102(b) over Kawahashi be withdrawn.

Claims 1-5 and 22-25 were rejected under 35 U.S.C. § 102(b) over Chiba et al. (EP 0789280). Applicants respectfully traverse this rejection for at least the following reasons.

Chiba et al. discloses a holding apparatus for holding a mask without employing a magnet or a vacuum chuck in a semiconductor exposure apparatus. The holding apparatus in Chiba et al. includes a base 10 having three clamp units 11a, 11b and 11c and a holding frame 20 having balls 21a, 21b and 21c, the holding balls 21a, 21b and 21c being fixed face-to-face to the respective clamp units 11a, 11b and 11c (see col. 3, lines 27-39 in Chiba et al.). A mask E is provided with a mask frame 2 for holding the mask E at an outer peripheral portion

of the mask. The mask frame 2 is provided with a conic groove 2a, a V-shaped groove 2b and a plane surface 2c with which the balls 21a, 21b and 21c are capable of coming into contact (see col. 4, lines 1-5 in Chiba et al.). To mount the mask, the mask E held by the mask frame 2 is inserted into a space area between the base 10 and the holding frame 20 and then the mask frame 2 is clamped by clamping forces perpendicularly between the balls 21a, 21b and 21c (see col. 4, lines 16-31 in Chiba et al.).

Therefore, Chiba et al. merely discloses structures consisting of conic groove 2a, V-shaped groove 2b and plane surface 2c which are located on the mask frame 2 and structures consisting of balls 21a, 21b and 21c which are located on the holding frame 20 and clamp units 11a, 11b and 11c which are located on the base 2. Clearly, Chiba does not disclose, teach or suggest connecting structures or locating structures on the mask. In fact, Chiba et al. uses an Si substrate to retain a membrane having the mask pattern and the mask frame 2 holds an outer peripheral portion of the substrate. Consequently, the mask in Chiba et al. is attached to the mask frame 2 via the Si substrate. Chiba et al. does not use connecting or locating structures to hold the mask.

Consequently, contrary to Examiner's contention, Chiba et al. does not disclose, teach or suggest "the holding comprising cooperation between a first set of connecting structures on the mask and a respective second set of connecting structures on a gripper," as recited in claim 1. Chiba et al. does not disclose, teach or suggest "kinematically determined holding comprising cooperation of a set of structures on a gripper with a respective set of structures provided in a circumferential region of the mask," as recited in independent claim 22. Kawahashi does not disclose, teach or suggest "the mask having an imaging portion and locating surfaces fixed with respect to the imaging portion," as recited in independent claim 23.

Furthermore, Chiba et al.'s structure does not allow a mask to be self-aligning in a horizontal direction. Additionally, Chiba et al.'s arrangement relies on the contact forces between the mask and the balls and clamps to hold the mask and it is not a kinematically-determined holding.

Consequently, for at least the above reasons, Chiba et al. does not disclose, teach or suggest the subject matter recited in claims 1, 22 and 23.

Therefore, Applicants respectfully submit that claims 1, 22 and 23, and claims 2-5 which depend from claim 1 and claims 24 and 25 which depend from claim 23, are patentable. Thus, Applicants respectfully request that the rejection of claims 1-5 and 22-25 under § 102(b) over Chiba et al. be withdrawn.

CONCLUSION


In view of the foregoing, the claims are in form for allowance, and such action is hereby solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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